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WATER WASTE¹

BY A. E. SKINNER²

Water waste is money waste because money necessarily must be expended in the collection, purification and distribution of water. The greater the water waste, the greater is the money waste in building larger dams and reservoirs, erecting larger filtration plants, effecting more chlorination, and installing larger pumps and pipe lines than actually are required.

The term water waste is applied to non-revenue producing water and is caused by waste from leaks of mains and services, house waste due to leaking plumbing fixtures, under-registration of meters, and the illegal use of water through fire lines or other means.

The importance of preventing water waste has been impressed forcibly upon water works officials due to the recent greatly increased production cost of water. Since it costs as much to produce waste water, or non-revenue producing water, as it does to produce consumed water, or revenue producing water, you can readily see that water waste being a money waste acts as a continuous financial drain on the resources of the water department.

Accordingly it may be of interest for the members of the Illinois Section to know of the method whereby one may quickly decrease operating costs and increase revenue by stopping the waste of water.

The method used successfully during the past twenty-five years in over three hundred cities in this country is called a Pitometer water waste survey. Such a survey accounts for the water supplied to the distribution system from the pumping station or from the reservoirs, as the case may be. In this accounting there necessarily is found the waste water which is part of the total amount supplied to the system.

A survey is started by measuring the total daily consumption supplied to the city. If this measurement is made at a pumping station, the pumps also are tested for slip or capacity. Some pump

¹Read before the meeting of the Illinois Section, March 30, 1922.

²Western Manager, The Pitometer Company, New York and Chicago.

tests have shown that the pumps were actually discharging one-half of their theoretical discharge.

The next step in a water waste survey is to divide the distribution system into districts and to measure the flow of water into each district throughout the twenty-four hours. A district is established by closing tightly the boundary valves in the system, thus segregating it from the rest of the system. The district is supplied with water through one main and a Pitometer is installed at a gauging point on that main. Then all the water used in the district under test is now measured for a period of at least twenty-four hours. From this continuous twenty-four hour record, the average daily consumption and the minimum night rate of flow of the district are obtained. If a district under test has no metered manufacturing consumption in it at night, to account satisfactorily for the night rate found between 1:00 a.m. and 4:00 a.m., it is necessary to investigate further to determine what causes the night rate.

Accordingly working at night the district is closed in again as described before and the Pitometer measures the flow into the district. By the proper operation of the valves within the district the flow between valves is measured and recorded on the Pitometer. Then obtaining a rate of flow on a main between certain valves, it becomes rather easy to trace this rate down to the particular point at which it occurs between the valves. The waste from this particular point is stopped and the saving is made permanent.

From this method as described, you will note that the only part of the system that is investigated is that which needs investigation, attention and correction as shown by the actual measurements of flow of water into that part.

Another feature of a Pitometer survey is the check on the large consumers for the illegal use of water through fire lines or by various ingenious methods. It is surprising how many large consumers favor free water. A number of cases might be cited where the back water bills based on the Pitometer measurements have covered many times the cost of the survey.

During the survey tests are made of all large meters in place for under-registration which is caused by the improper selection, installation and care of the meters. The correction of the under-registration of the large meters greatly increases the revenue of the water department. Most departments are handicapped by not having means of testing their large meters under actual service conditions

and a Pitometer will quickly and accurately give the department the information needed.

Incidentally in the routine work of a survey many conditions unknown to the officials are discovered such as the location of mains and valves, some of which exist and others do not, the finding of broken or closed valves which affect the repairs and pressures of a distribution system, and the measurement of consumption in various sections, which aids in the planning of re-inforcements to the system. In fact, in some cities a Pitometer water waste survey has postponed the need for new equipment or extensions by the elimination of the waste water.